

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-330202

(43)Date of publication of application : 15.12.1998

(51)Int.Cl.

A01N 25/04

A01N 25/12

A01N 25/14

A01N 25/30

A01N 43/713

(21)Application number : 09-156033

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(22)Date of filing : 30.05.1997

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(54) AQUEOUS SUSPENSION TYPE HERBICIDE COMPOSITION AND WEEDING USING THE SAME

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an aqueous suspension type herbicide composition showing good weeding effect and no harmful effect of medicine for paddy rice transplantation and treatment, and also provide a weeding method.

SOLUTION: This herbicide composition comprises 0.5 to 60 wt.% of one or more herbicidal active compounds sparingly soluble or insoluble in water, having a median particle size of 0.5 to 10 μ m, and 30 to 97 wt.% of water, contains a sufficient quantity of surfactant to keep the active herbicidal compound(s) suspended, and has a viscosity of 90 to 500 mPa.s at 25°C.

LEGAL STATUS

[Date of request for examination] 13.04.2004

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

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2. **** shows the word which can not be translated.
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CLAIMS

[Claim(s)]

[Claim 1] The letter herbicide constituent of aqueous suspension for paddy rice transplantation simultaneous processing characterized by containing the surfactant of a complement by maintaining this weeding-out activity compound at a suspension condition further, and the viscosity in 25 degrees C being within the limits of 90 - 500 mPa-s at the water whose middle particle diameter is 0.5-10 micrometers coming [one sort or two sorts or more of 0.5 - 60 % of the weight of weeding-out activity compounds and 30 - 97 % of the weight of water, poor solubility or insolubility,].

[Claim 2] The letter herbicide constituent of aqueous suspension according to claim 1 whose middle particle diameter is 1-5 micrometers.

[Claim 3] The letter herbicide constituent of aqueous suspension according to claim 1 which contains one sort or two sorts or more of weeding-out activity compounds five to 30% of the weight.

[Claim 4] The letter herbicide constituent of aqueous suspension according to claim 1, 2, or 3 which contains a tetra-ZORINON system compound as a weeding-out activity compound.

[Claim 5] The letter herbicide constituent of aqueous suspension according to claim 1 which contains water 50 to 90% of the weight.

[Claim 6] The letter herbicide constituent of aqueous suspension according to claim 1 which is one sort chosen from the group which a surfactant becomes from the polyoxyalkylene alkylphenyl ether, polyoxyalkylene tris CHIRIRU phenyl ether, a polyoxyalkylene alkylphenyl ethereal sulfate salt, a polyoxyalkylene tris CHIRIRU phenyl ether sulfate, a polyoxyalkylene TORISUCHIRIRU phenyl ether phosphoric-acid amine salt, and dioctyl sulfosuccinate sodium salt, or two sorts or more.

[Claim 7] The letter herbicide constituent of aqueous suspension according to claim 1 which has the viscosity in 25 degrees C within the limits of 120 - 300 mPa-s.

[Claim 8] The letter herbicide constituent of aqueous suspension according to claim 1 which contains further a water soluble polymer, mineral matter, pH regulator, a defoaming agent, antiseptics, and/or an antifreezing agent.

[Claim 9] It comes to contain one sort or two sorts or more of 0.5 - 60 % of the weight of weeding-out activity compounds and 30 - 97 % of the weight of water, poor solubility or insolubility, in the water whose middle particle diameter is 0.5-10 micrometers. And the prevention approach of the weeds characterized by using the letter herbicide constituent of aqueous suspension which contains the surfactant of a complement further to maintain this weeding-out activity compound at a suspension condition, and has the viscosity in 25 degrees C within the limits of 90 - 500 mPa-s for rice field area water at paddy rice transplantation and coincidence.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the agricultural-chemicals field, a new pharmaceutical preparation technique [in / especially / a herbicide], and the weed control approach. This invention relates to the letter herbicide constituent of aqueous suspension and the weed control approach for processing to paddy rice transplantation and coincidence in more detail.

[0002]

[A Prior art and a technical technical problem] In the agricultural-chemicals field, based on the pharmaceutical form of pharmaceutical preparation, the class is divided from old, especially, in the field of the herbicide for paddy rice, a use scene is the weed control in rice field area water, and the granule of a granular gestalt has occupied the mainstream in consideration of the ability to use [that a use dose can be supplied certainly and] it in reduction of labor. However, since it having to sprinkle to homogeneity as much as possible and relief of activity labor are measured in the whole rice field area water in the case of a granule gestalt, reduction of the irrelevance by increasing the content of the technique and active principle (weeding-out active ingredient) which enlarge the granule itself in recent years is measured.

[0003] On the other hand, the herbicide constituent of an emulsion gestalt is also slightly used as an object for rice planting pretreatment conventionally as a liquids-and-solutions gestalt out of the solid preparation until now. Furthermore, recently, the herbicide of the letter of aqueous suspension is beginning to be used as an object for rice planting after treatment as a liquids-and-solutions gestalt. As a well-known technique about this letter herbicide of aqueous suspension For example, the aqueous suspension agricultural-chemicals pharmaceutical preparation whose HLB blended ten or less nonionic surfactant (one sort or two sorts or more) and the thickener for the purpose of stabilization of an agricultural-chemicals active ingredient (JP,60-1101,A), How (JP,62-84002,A) to use for rice planting pretreatment of a ponding paddy field the letter herbicide constituent for paddy fields of suspension with which a certain kind of specific compound was contained, and viscosity was adjusted to 250 to 30 centipoise, In the approach (JP,62-87501,A) of using the herbicide for water suspension paddy fields and it which have a specific physical property (viscosity, an initial ***** exhibition rate, and surface tension), before transplanting rice seedlings, and the aqueous suspension pharmaceutical preparation which atomized The letter agricultural-chemicals pharmaceutical preparation of aqueous suspension aiming at suppressing especially the particle growth by the high temperature service (JP,5-43401,A), The letter herbicide constituent for paddy fields of suspension which paid its attention to antisticking of the drugs to the rice leaf blade which is the description of the mixture, and which scatters and mainly originates in spraying (JP,5-105601,A), The application-on-water-surface weeding-out pharmaceutical preparation (JP,5-201801,A) aiming at improvement in long-term-storage stability and underwater diffusibility etc. is mentioned.

[0004] Thus, although the technique about many letter pharmaceutical preparation of aqueous suspension is proposed, technical problems which should be solved, such as maldistribution-izing of the weeding-out effectiveness that the problem of adhesion in the leaf blade section of the paddy rice rice seedling resulting from the liquids-and-solutions mold pharmaceutical preparation which they have essentially, and a dusting powder agent scatter, and diffusibility happens to the problem of unevenness and a list at eye the backlash which is not enough, and a problem of generating of phytotoxicity, still remain.

[0005]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, as a result of performing examination from the field of the approach of the letter pharmaceutical preparation of aqueous suspension itself, with the letter herbicide constituent of aqueous suspension for paddy rice transplantation simultaneous processing explained below, this invention persons find out that the above-mentioned technical problem is solvable, and came to complete this invention this time.

[0006] Namely, according to this invention, it comes to contain one sort or two sorts or more of 0.5 - 60 % of the weight of weeding-out activity compounds and 30 - 97 % of the weight of water, poor solubility or insolubility, in the water whose middle particle diameter is 0.5-10 micrometers. And the letter herbicide

constituent of aqueous suspension for paddy rice transplantation simultaneous processing characterized by containing the surfactant of a complement further maintaining this weeding-out activity compound at a suspension condition, and the viscosity in 25 degrees C being within the limits of 90 - 500 mPa-s is offered. [0007] according to this invention, since the latter herbicide constituent of aqueous suspension for the above-mentioned paddy rice transplantation simultaneous processing is used for paddy rice transplantation, simultaneously rice field area water, it not only being able to make timely discovered but it can perform uniform drugs processing and the operation effectiveness of a weeding-out active ingredient is exactly referred to as being able to process to package coincidence at the time of rice planting from the point of working efficiency (laborsaving) -- it is dramatically advantageous practically and excels. Since machine transplantation of the present paddy rice seedling is performed widely, especially the above-mentioned constituent of this invention has the advantage that it can process to paddy rice transplantation and coincidence easily, by equipping a machine for planting seedlings with the container of this constituent beforehand, and usually using a desired dose for rice field area water with transplantation of a machine for planting seedlings.

[0008] In this invention, "middle particle diameter" is used as a scale which shows the "average particle" system of a particle group, and the value is shown with the value of particle diameter in case the cumulative distribution which integrated with and searched for the frequency distribution showing what% of the whole particle exists within the fixed grain-size section from the one where particle diameter is smaller, or the larger one show 50%. The weeding-out activity compound used in this constituent of this invention can have preferably 0.5-10 micrometers of middle particle diameter within the limits of 1-5 micrometers.

[0009] Although the weeding-out activity compound used by this invention is not especially restricted if it is usually used as an object for paddy fields, a poorly soluble or insoluble thing is suitable for it in water especially. Here, "they are poor solubility or insolubility to water" means that the solubility to the water in 25 degrees C is 100 ppm or less in general. A deer can be carried out and the following can be illustrated in such water as an example of representation of a poorly soluble or insoluble weeding-out activity compound.

[0010] A 2-benzothiazole-2-yloxy-N-methyl acetanilide, (RS) -2-BUROMO-N-(alpha and alpha-dimethylbenzyl)-3 and 3-dimethyl butyl amide, 2-chloro - 2' and 6'-diethyl-N-(2-PUROPO pheasant ethyl) acetanilide, 2-chloro - 2' and 6'-diethyl-N-(BUTOKI dimethyl) acetanilide, A 2-chloro-N-(3-methoxy-2-thenyl)-2' and 6'-dimethyl acetanilide, S-(4-chloro benzyl)-N and N-diethyl thio carver mate, The S-benzyl 1, 2-dimethyl propyl (ethyl) thio carver mate, An O-3-tert-buthylphenyl 6-methoxy-2-pyridyl (methyl) thio carver mate, S-ethyl hexahydro-1H-azepine-1-carbothioate, 1-(diethylcarbamoyl)-3-(2, 4, 6-trimethyl phenyl sulfonyl)- 1, 2, and 4-triazole -- ZORINON 1-(2-chlorophenyl)-4-(N-cyclopentyl-N-ethyl carbamoyl)-5(4H)-tetra--- ZORINON 1-(2-chlorophenyl)-4-(N-cyclopentyl-N-propyl carbamoyl)-5(4H)- tetra--- ZORINON 1-(2-chlorophenyl)-4-(N-cyclohexyl-N-ethyl carbamoyl)-5(4H)- tetra--- ZORINON 1-(2-chloro-6-methylphenyl)-4-(N-cyclopentyl-N-propyl carbamoyl)-5(4H)- tetra--- ZORINON 1-(2-BUROMO phenyl)-4-(N-cyclopentyl-N-ethyl carbamoyl)-5(4H)- tetra--- ZORINON 1-(2-BUROMO phenyl)-4-(N-cyclopentyl-N-propyl carbamoyl)-5(4H)- tetra--- ZORINON 1-(2-BUROMO-6-methylphenyl)-4-(N-cyclopentyl-N-propyl carbamoyl)-5(4H)- tetra--- Methyl 2-[(4,6-dimethoxy-2-pyrimidinyl) oxy]-6-[1-(methoxy imino) ethyl] benzoate, Methyl alpha-(4, 6-dimethoxy pyrimidine)-2-IRUKARUBA moil sulfamoyl-O-torr art, Ethyl 5-(4, 6-dimethoxy pyrimidine-2-IRU-carbamoyl sulfamoyl)-1-methyl pyrazole-4-carboxylate, N-(2-chloro [1 and 2-imidazole a] pyridine-3-IRU-sulfonyl)-N-(4, 6-dimethoxy-2-pyrimidyl) urea, An N-([4 and 6-dimethoxy pyrimidine-2-IRU] aminocarbonyl)-1-methyl-4-(2-methyl-2H-tetrazole-5-IRU)-1H-pyrazole-5-sulfonamide, N-([4 and 6-dimethoxy-1,3,5-triazine-2-IRU] aminocarbonyl)-2-(2-methoxyethoxy) benzenesulfonamide, 1-[[O-(cyclo propylcarbonyl) phenyl] Sulfamoyl]-3-(4,6-dimethoxy-2-pyrimidinyl) urea, 4-(2, 4-dichlorobenzoyl)-1, 3-dimethyl pyrazole-5-IRU-p-toluene sulfonate, 2-[4-(2, 4-dichloro-m-toluoyl)-1 and 3-dimethyl pyrazole-5-yloxy]-4-methylacetophenone, 2-[4-(2, 4-dichlorobenzoyl)-1 and 3-dimethyl pyrazole-5-yloxy] KOASETO phenon, 2-(beta-naphthyloxy) propione anilide, a (RS)-2-(2, 4-dichloro-m-tolyloxy) propione anilide, n-(butyl R)-2-[4-(4-cyano-2-fluorophenoxy) phenoxy] propionate, 1-(alpha and alpha-dimethylbenzyl)-3-p-tolyl urea, N-[(2-chlorophenyl) methyl]-N'-(1-methyl-1-phenylethyl) urea, 2-methyl-4-chloro phenoxy butanoic acid, acetic acid, 2, 4-bis(ethylamino)-6-methylthio-1,3,5-triazine, [3-(2-chloro-4-methylsulfonyl benzoyl)-4-phenylthio] bicyclo [3.2.1] oct-3-en-2-ON (1, 2-dimethyl propylamino) etc.

[0011] this constituent of this invention is independent about the weeding-out activity compound like the

above-mentioned instantiation -- it is -- two or more sorts are combined, and although it can contain, what contains the weeding-out activity compound of a tetra-ZORINON system especially is suitable.

[0012] The content of the weeding-out activity compound in this constituent of this invention can be preferably made into 5 - 30% of the weight of within the limits 0.5 to 60% of the weight.

[0013] In the constituent of this invention, especially the surfactant used in order to maintain a weeding-out activity compound at a suspension condition is not restricted, and can be chosen from the large range according to the class of weeding-out activity compound etc., for example, the following can be used for it as a well-known typical thing.

[0014] A ligninsulfonic acid salt, alkyl phosphate, a fatty-acid salt, an alkyl sulfonate, Alkylbenzene sulfonates, alkyl naphthalenesulfonate, A naphthalene sulfonic-acid formalin condensate, polyoxyalkylene alkyl ether sulfate, A polyoxyalkylene alkylphenyl ethereal sulfate salt, a polyoxyalkylene tris CHIRIRU phenyl ether sulfate, A polyoxyethylene, a polyoxypropylene block polymer sulfate, Dialkyl sulfosuccinate, a polyoxyalkylene alkyl ether sulfosuccinate salt, Anion system surfactants, such as a polyoxyalkylene alkylphenyl ether phosphate salt; The polyoxyalkylene alkylphenyl ether, Polyoxyalkylene fatty acid ester, polyoxyalkylene tris CHIRIRU phenyl ether, Polyoxyalkylene alkylamine, a sorbitan fatty acid ester, Sucrose fatty acid ester, polyoxyalkylene sorbitan ester, A glycerine fatty acid ester, polyoxyethylene-polyoxypropylene block polymer, The Nonion system surface active agents, such as the polyoxyethylene-polyoxypropylene block polymer alkylphenyl ether; An aliphatic series alkyl betaine, Amphoteric surface active agents, such as alkyl ammonium salt; cation system surfactants, such as alkyl pyridinium salt and a polyethylene polyamine fatty-acid amide.

[0015] As a surfactant used for this invention, the polyoxyalkylene alkylphenyl ether, polyoxyalkylene tris CHIRIRU phenyl ether, a polyoxyalkylene alkylphenyl ethereal sulfate salt, a polyoxyalkylene tris CHIRIRU phenyl ether sulfate, a polyoxyalkylene TORISUCHIRIRU phenyl ether-phosphoric-acid amine salt, and dioctyl sulfosuccinate sodium salt can be illustrated preferably.

[0016] the constituent of this invention is independent about the surfactant like the above-mentioned instantiation -- it is -- two or more sorts can be combined and it can contain. In this invention, although it is used by the complement for maintaining a weeding-out activity compound at an aqueous suspension condition and the amount is decided by physical properties, such as particle size of the particle in a dispersed system, the class of surfactant, a property, etc., this surfactant can be easily determined by conducting a small-scale experiment, if it is this contractor.

[0017] The constituent of this invention can make the content of water preferably 50 - 90% of the weight of within the limits 30 to 97% of the weight, using water as a dispersion medium.

[0018] The constituent of this invention is adjusted so that the viscosity in 25 degrees C may become within the limits of 120 - 300 mPa-s preferably 90 to 500 mPa-s. When the viscosity of this constituent is less than 90 mPa-s, at the time of storage, sedimentation of a suspension particle increases and a satisfying property cannot be maintained in respect of stability as a product. On the other hand, if 500 mPa-s is exceeded, the Botha omission will tend to happen at the time of spraying, and since the flare of an active principle [in / by lowering of diffusibility / rice field area underwater] is not enough, it is not desirable from effectiveness.

[0019] Addition of the water soluble polymer compound and/or mineral matter which are illustrated by the postscript etc. can perform adjustment of the viscosity in the constituent of this invention suitably.

[0020] This constituent of this invention can also contain a water soluble polymer compound by the case for distributed stabilization of the weeding-out activity compound which it atomized. As an example of representation of the water soluble polymer compound which can be used, gum arabic, sodium alginate, tragacanth gum, xanthan gum (xanthan gum), a dextrin, gelatin, casein, methyl cellulose, hydroxyethyl cellulose, hydroxypropylcellulose, a carboxymethyl cellulose, polyvinyl alcohol, a polyvinyl pyrrolidone, sodium polyacrylate, etc. can be mentioned, for example.

[0021] Moreover, since much more distributed stabilization of the constituent of this invention is achieved, it is also possible to add pH regulators, such as mineral matter; dibasic sodium phosphate, such as white carbon, a bentonite, talc, and a kaolin, and a citric-acid phosphoric-acid hydrogen potassium, if needed.

[0022] Furthermore, the defoaming agent for suppressing foaming at the time of an activity as other adjuvants to the constituent of this invention at a list at the time of manufacture For example, (a silicone oil emulsion etc. and antiseptics) for example, Preventol -- : active principle benzyl alcohol monochrome [by

D2 (trade name) Bayer] (Pori) hemi FORU marl -- Pro KUSERU GXL (trade name) Zeneka Co. make : An active principle 1, 2-benzisothiazolin-3-one 20% content, etc., The antifreezing agents for cold district preservation (for example, ethylene glycol, propylene glycol, a glycerol, ethanol, isopropanol, a urea, etc.) etc. can also be blended with arbitration in the range to which the configuration of the constituent of this invention is not changed substantially.

[0023] The manufacture approach of the letter herbicide constituent of aqueous suspension of this invention Although not limited especially, generally add a weeding-out activity compound to the solution which consists of water and a surfactant, and it mixes. although wet grinding mills, such as a ball mill and a sand mill, are made to atomize and distribute --; after grinding a weeding-out activity compound to some extent beforehand Mix with a surfactant and the solution which consists of water, after that, perform wet grinding, and atomize and distribute it, or in the case of; or the low weeding-out activity compound of the melting point Carry out heating melting of the weeding-out activity compound to 50-90 degrees C, mix a surfactant with it, and by approaches, such as adding water, agitating this mixed solution, returning to a room temperature after that, atomizing with the same wet grinding as the above, and making it distribute The constituent of target this invention can be obtained.

[0024] This invention offers the weed control approach of using the letter herbicide constituent of aqueous suspension of this invention again.

[0025] The approach is characterized by using the letter herbicide constituent of aqueous suspension of this invention mentioned above for rice field area water at paddy rice transplantation and coincidence.

[0026] The most desirable mode in the case of enforcing the approach of this invention requiring is the approach of equipping with the container with which this letter herbicide constituent of aqueous suspension went into the machine for planting seedlings, and sprinkling this constituent of a desired dose to rice planting and coincidence in a rice field area according to migration of automatic ***** by the machine for planting seedlings and a machine for planting seedlings (drugs processing). Although especially the magnitude of the wearing container in that case is not limited, generally the container whose volume is about 0.6 - 5l. of abbreviation is chosen.

[0027] By the weed control approach of this invention, a lowland weed can be prevented much more exactly as compared with the conventional granule use, the use after rice planting of the letter herbicide of aqueous suspension, etc.

[0028] It faces enforcing the weed control approach of this invention, and, generally amount of application of the constituent of this invention can be preferably made into within the limits of 5 - 10 l/ha five to 20 l/ha. However, this amount is a temporary rule of thumb, and can be changed into arbitration by a class, a water rice field area product, etc. of a weeding-out activity compound.

[0029] In addition, although the well-known letter herbicide of aqueous suspension for rice planting after treatment was scattered, and the amount of application was restricted in consideration of hand control since it was business, in the constituent of this invention, such a limit especially is not required and its versatility is very high.

[0030] Although an example is shown and this invention is explained still more concretely hereafter, this invention is not limited to these instantiation.

[0031]

[Example] The weeding-out activity compound in a constituent given in an example is as follows.

[0032] compound A: -- 1-(2-chlorophenyl)-4-(N-cyclohexyl-N-ethyl carbamoyl)- 5(4H)-tetra-ZORINON
bensulfuron-methyl (generic name)

Imazosulfuron (generic name)

Dymron (generic name)

Compound B: 1-[[o-(cyclo propylcarbonyl) phenyl] Sulfamoyl]-3-(4,6-dimethoxy-2-pyrimidinyl) urea
benzoFENAPPU (generic name)

Compound C: [3-(2-chloro-4-methylsulfonyl benzoyl)-4-phenylthio] bicyclo [3.2.1] oct-3-en-2-on-MEFENA
set (generic name)

Bromobutide (generic name)

Among an example, especially the "section" is the weight section, unless it refuses.

[0033] the example 1 ethylene-glycol 10 section and the new cull gene FS 21 (a trade name --) The

Takemoto fats-and-oils company make, a component : The polyoxyalkylene alkylphenyl ether, Dioctyl sulfosuccinate sodium salt, the combination article 3 section of isopropanol, Preventol D2 (a trade name, Bayer make) and SAG-10 (a trade name --) A magnet stirrer may be used and churning mixing of the Nippon Unicar make, the 14% silicone oil emulsion 0.5 of components section, and the water 82.25 section is carried out. After adding the compound A4 section and the xanthan gum 0.15 section into the mixed liquor and agitating well, it put in into the grinding container of a die no mill KDL mold (product made from Willy A.Bachofeu), and 3000 rpm, it ground for 5 minutes and aquosity suspension pharmaceutical preparation was obtained.

[0034] It was 2.2 micrometers as a result of measuring middle particle diameter for the obtained aquosity suspension pharmaceutical preparation using the high-resolution submicron laser grading-analysis equipment GURANYURO meter HR 850 (the C lath company make). Moreover, as a result of measuring viscosity using a rotational viscometer, in 25 degrees C, they were 145 mpa-s.

[0035] The letter herbicide constituent of aquosity suspension of this invention obtained by the same actuation as the above is shown below.

[0036] Example 2 compound A 4 section new cull gene FS-1 The three sections (a part for a trade name and the Takemoto fats-and-oils company production: polyoxyalkylene tris CHIRIRU phenyl ether) SAG-10 0.5 section xanthan gum 0.15 section ethylene glycol 10 section Preventol D2 0.1 **** 82.25 section viscosity: 143 mPa-s (25 degrees C)

Middle particle diameter: 2.1-micrometer example 3 compound A 6 section new cull gene FS-3 The three sections (a part for a trade name and the Takemoto fats-and-oils company production: polyoxyalkylene TORISUCHIRIRU phenyl ether phosphoric-acid amine salt) SAG-10 0.5 section xanthan gum 0.15 section ethylene glycol 8 section Preventol D2 0.1 **** 82.25 section viscosity: 139 mPa-s (25 degrees C)

Middle particle diameter : 2.1-micrometer example 4 compound A 6 section new cull gene FS-1 1.5 section new cull gene FS-3 1.5 section SAG-10 0.5 section xanthan gum 0.15 section ethylene glycol 8 section Preventol D2 0.1 **** 82.25 section viscosity: 143 mPa-s (25 degrees C)

Middle particle diameter : 2.2-micrometer example 5 compound A 4 section bensulfuron-methyl 1.5 section new cull gene FS-21 2 section SAG-10 0.5 section xanthan gum 0.15 section propylene glycol 10 section Preventol D2 0.1 **** 81.75 section viscosity: 142 mPa-s (25 degrees C)

Middle particle diameter : 3.3-micrometer example 6 compound A 4 section bensulfuron-methyl 1 section dymron 9 section new cull gene FS-21 2 section SAG-10 0.5 section xanthan gum 0.15 section propylene glycol 10 section Preventol D2 0.1 **** 73.25 section viscosity: 169 mPa-s (25 degrees C)

Middle particle diameter: 3.2-micrometer example 7 compound A 4 section bensulfuron-methyl 1 section dymron 9 section new cull gene FS-21 3 section SAG-10 0.5 section Aerosil 200V The 0.5 sections (a part for a trade name and the Japanese Aerosil production: silica)

Xanthan gum 0.15 section propylene glycol 5 section Preventol D2 0.1 **** 76.75 section viscosity: 165 mPa-s (25 degrees C)

Middle particle diameter : 3.0-micrometer example 8 compound A 4 section imazosulfuron 1.8 section dymron 20 section new cull gene FS-21 2 section SAG-10 0.5 section xanthan gum 0.1 section propylene glycol 10 section Preventol D2 0.1 **** 61.5 section viscosity: 472 mPa-s (25 degrees C)

Middle particle diameter : 4.5-micrometer example 9 compound A 6 section imazosulfuron 1.8 section dymron 20 section new cull gene FS-21 2 section SAG-10 0.5 section xanthan gum 0.1 section propylene glycol 10 section Preventol D2 0.1 **** 59.5 section viscosity: 472 mPa-s (25 degrees C)

Middle particle diameter : 3.7-micrometer example 10 compound A 6 section imazosulfuron 1.8 section dymron 20 section new cull gene FS-21 3 section SAG-10 0.5 section xanthan gum 0.1 section Aerosil 200V 0.2 section propylene glycol 5 section Preventol D2 0.1 **** 58.85 section viscosity: 100 mPa-s (25 degrees C)

Middle particle diameter : 2.8-micrometer example 11 compound A Four section compounds B 1 section dymron 8 section new cull gene FS-21 3 section SAG-10 0.5 section xanthan gum 0.1 section Aerosil 200V 0.2 section propylene glycol 5 section Preventol D2 0.1 **** 78.1 section viscosity: 97 mPa-s (25 degrees C)

Middle particle diameter : 2.3-micrometer example 12 compound A Four section compounds B 1.2 section dymron 8 section new cull gene FS-21 3 section SAG-10 0.5 section xanthan gum 0.1 section Aerosil 200V

The 0.2 section KUNIPIA F 0.2 section (a part for a trade name and sodium montmorillonite)

Propylene glycol 5 section Preventol D2 0.1 **** 77.7 section vis

Middle particle diameter : 2.6-micrometer example 13 compound

benzoFENAPPU 20 section new cull gene FS-21 5 section SA

propylene glycol 10 section Preventol D2 0.1 **** 54.25 sec

Middle particle diameter: 2.2-micrometer example 14:grind

section new cull gene FS-1 3 section SAG-10 0.5 section y

Preventol D2 0.1 **** 82.25 section viscosity: -- 145 mP

example 15:grinding conditions Compound A 2000 rpm

dymron 20 section new cull gene FS-21 2 section SA

glycol 10 section Preventol D2 0.1 **** 61.5 section

micrometer example 16 compound A 6 section new

gum 0.2 section ethylene glycol 8 section Preventol D2 0.1

particle diameter: -- 2.1-micrometer example 17 compound A

dymron 9 section new cull gene FS-21 2 section SAG-10 0.5 section

glycol 10 section Preventol D2 0.1 **** 73.2 section viscosity: -- 293 mP

example of 3.2-micrometer comparison 1 compound A 6 section new cull gene

section xanthan gum 0.35 section ethylene glycol 8 section Preventol D2 0.1 **** 82.5

560 mPa-s middle particle diameter: -- example of 2.3-micrometer comparison 2 compound

cull gene FS-3 3 section SAG-10 0.5 section xanthan gum 0.4 section ethylene glycol 8 section

0.1 **** 82 section viscosity: -- 670 mPa-s middle particle diameter: -- example of 2.5-micrometer

comparison 3:grinding conditions 2000rpm and 1-minute compound A 6 section new cull gene FS-1 3

section SAG-10 0.5 section xanthan gum 0.15 section ethylene glycol 8 section Preventol D2 0.1 **** 82.25

section viscosity: -- 140 mPa-s middle particle diameter: -- example of 11.3-micrometer comparison

4:grinding conditions Compound A for 30 seconds 2000 rpm 6 section new cull gene FS-3 3 section SAG-10

0.5 section xanthan gum 0.15 section ethylene glycol 8 section Preventol D2 0.1 **** 82.25 section

viscosity: -- 135 mPa-s middle particle diameter: -- example of 13.2-micrometer comparison 5:grinding

conditions Compound A 2000 rpm for 1 minute 6 section new cull gene FS-1 1.5 section new cull gene FS-3

1.5 section SAG-10 0.5 section xanthan gum 0.4 section ethylene glycol 8 section Preventol D2 0.1 **** 82

section viscosity: -- 650 mPa-s middle particle diameter: -- example 6 of 11.2-micrometer comparison

Compound A 6 section new cull gene FS-1 3 section SAG-10 0.5 section ethylene glycol 8 section Preventol

D2 0.1 **** Water is put in. 82.4 section viscosity: -- 45 mPa-s middle particle diameter: -- so that it may

become the vat made of a plastic of 2 (0.8mx1.3m) with the depth of water of 3cm 1.04m of example of 2.1-

micrometer trial 1:dispersibility trials 1ml of letter constituents of aqueous suspension obtained in the

example and the example of a comparison was calmly dropped in the center of this vat. After putting at a

room temperature (23-26 degrees C) for 6 hours, the weeding-out active-ingredient concentration of the

center (the Ath division) of a vat and four corners (B-E division) of a vat was measured. The rate to

theoretical underwater concentration when a degree type distributes to homogeneity underwater [in the vat
of a weeding-out active ingredient] shows dispersibility.

[0037]

[Equation 1]

A~E区における水中濃度

分散性% = $\frac{\text{A~E区における水中濃度}}{\text{理論水中濃度}} \times 100$

理論水中濃度

[0038] A result is shown in the 1st table.

[0039]

[A table 1]

The 0.2 section KUNIPIA F 0.2 section (a part for a trade name and the Kunimine Industries production: sodium montmorillonite)

Propylene glycol 5 section Preventol D2 0.1 **** 77.7 section viscosity: 87 mPa-s (25 degrees C)

Middle particle diameter : 2.6-micrometer example 13 compound A Six section compounds C 4 section

benzoFENAPPU 20 section new cull gene FS-21 5 section SAG-10 0.5 section xanthan gum 0.15 section

propylene glycol 10 section Preventol D2 0.1 **** 54.25 section viscosity: 385 mPa-s (25 degrees C)

Middle particle diameter: 2.2-micrometer example 14:grinding conditions 2000rpm, 3-minute compound A 6

section new cull gene FS-1 3 section SAG-10 0.5 section xanthan gum 0.15 section ethylene glycol 8 section

Preventol D2 0.1 **** 82.25 section viscosity: -- 145 mPa-s middle particle diameter: -- 6.8-micrometer

example 15:grinding conditions Compound A 2000 rpm for 3 minutes 4 section imazosulfuron 1.8 section

dymron 20 section new cull gene FS-21 2 section SAG-10 0.5 section xanthan gum 0.1 section propylene

glycol 10 section Preventol D2 0.1 **** 61.5 section viscosity: -- 476 mPa-s middle particle diameter: -- 9.2-

micrometer example 16 compound A 6 section new cull gene FS-3 3 section SAG-10 0.5 section xanthan

gum 0.2 section ethylene glycol 8 section Preventol D2 0.1 **** 82.2 section viscosity: -- 278 mPa-s middle

particle diameter: -- 2.1-micrometer example 17 compound A 4 section bensulfuron-methyl 1 section

dymron 9 section new cull gene FS-21 2 section SAG-10 0.5 section xanthan gum 0.2 section propylene

glycol 10 section Preventol D2 0.1 **** 73.2 section viscosity: -- 293 mPa-s middle particle diameter: --

example of 3.2-micrometer comparison 1 compound A 6 section new cull gene FS-1 3 section SAG-10 0.5

section xanthan gum 0.35 section ethylene glycol 8 section Preventol D2 0.1 **** 82.05 section viscosity: --

560 mPa-s middle particle diameter: -- example of 2.3-micrometer comparison 2 compound A 6 section new

cull gene FS-3 3 section SAG-10 0.5 section xanthan gum 0.4 section ethylene glycol 8 section Preventol D2

0.1 **** 82 section viscosity: -- 670 mPa-s middle particle diameter: -- example of 2.5-micrometer

comparison 3:grinding conditions 2000rpm and 1-minute compound A 6 section new cull gene FS-1 3

section SAG-10 0.5 section xanthan gum 0.15 section ethylene glycol 8 section Preventol D2 0.1 **** 82.25

section viscosity: -- 140 mPa-s middle particle diameter: -- example of 11.3-micrometer comparison

4:grinding conditions Compound A for 30 seconds 2000 rpm 6 section new cull gene FS-3 3 section SAG-10

0.5 section xanthan gum 0.15 section ethylene glycol 8 section Preventol D2 0.1 **** 82.25 section

viscosity: -- 135 mPa-s middle particle diameter: -- example of 13.2-micrometer comparison 5:grinding

conditions Compound A 2000 rpm for 1 minute 6 section new cull gene FS-1 1.5 section new cull gene FS-3

1.5 section SAG-10 0.5 section xanthan gum 0.4 section ethylene glycol 8 section Preventol D2 0.1 **** 82

section viscosity: -- 650 mPa-s middle particle diameter: -- example 6 of 11.2-micrometer comparison

Compound A 6 section new cull gene FS-1 3 section SAG-10 0.5 section ethylene glycol 8 section Preventol

D2 0.1 **** Water is put in. 82.4 section viscosity: -- 45 mPa-s middle particle diameter: -- so that it may

become the vat made of a plastic of 2 (0.8mx1.3m) with the depth of water of 3cm 1.04m of example of 2.1-

micrometer trial 1:dispersibility trials 1ml of letter constituents of aqueous suspension obtained in the

example and the example of a comparison was calmly dropped in the center of this vat. After putting at a

room temperature (23-26 degrees C) for 6 hours, the weeding-out active-ingredient concentration of the

center (the Ath division) of a vat and four corners (B-E division) of a vat was measured. The rate to

theoretical underwater concentration when a degree type distributes to homogeneity underwater [in the vat

of a weeding-out active ingredient] shows dispersibility.

[0037]

[Equation 1]

A~E区における水中濃度

分散性% = $\frac{\text{A~E区における水中濃度}}{\text{理論水中濃度}} \times 100$

理論水中濃度

[0038] A result is shown in the 1st table.

[0039]

[A table 1]

第 1 表

試験区	化 合 物	増 粘 剤	粘 度 mPa·s	粒子径 μm	A区 %	B区 %	C区 %	D区 %	E区 %
実施例 1	化合物A 6.0%	キソナツガム 0.15%	145	2.2	100	100	96	97	100
2	化合物A 6.0%	キソナツガム 0.15%	143	2.1	102	99	101	96	97
3	化合物A 6.0%	キソナツガム 0.15%	139	2.1	103	98	95	99	100
4	化合物A 6.0%	キソナツガム 0.15%	143	2.2	101	96	90	93	99
5	化合物A 4.0% ツズメワロツジ 1.5%	キソナツガム 0.15%	142	3.3	100	97	93	98	101
6	化合物A 4.0% ツズメワロツジ 1.0% アクリル 9.0%	キソナツガム 0.15%	169	3.2	103	93	99	100	96
7	化合物A 4.0% ツズメワロツジ 1.0% アクリル 9.0%	キソナツガム 0.15%	165	3.0	100	92	99	103	91
8	化合物A 4.0% イソブチル 1.8% アクリル 20.0%	キソナツガム 0.1%	472	4.5	110	92	88	90	95
9	化合物A 6.0% イソブチル 1.8% アクリル 20.0%	キソナツガム 0.1%	472	3.7	108	93	90	87	96
10	化合物A 6.0% イソブチル 1.8% アクリル 20.0%	キソナツガム 0.1% アクリル 200V 0.2%	100	2.8	100	99	98	99	100

[0040]

[A table 2]

第 1 表 (続)

11	化合物A 4.0%	キリシロ 0.1%	97	2.3	101	99	100	101	98
	化合物B 1.0%	アロワ200V 0.2%							
	ダイオ 8.0%								
12	化合物A 4.0%	キリシロ 0.1%	87	2.6	102	100	98	101	99
	化合物B 1.2%	アロワ200V 0.2%							
	ダイオ 8.0%	クニ7F 0.2%							
13	化合物A 6.0%	キリシロ 0.15%	385	2.2	106	96	95	97	93
	化合物C 4.0%								
	アロワ200V 20.0%								
14	化合物A 6.0%	キリシロ 0.15%	145	6.8	104	94	98	99	98
15	化合物A 4.0%	キリシロ 0.10%	476	9.2	107	90	87	95	93
	アロワ200V 1.8%								
	ダイオ 20.0%								
16	化合物A 6.0%	キリシロ 0.20%	278	2.1	105	93	90	93	96
17	化合物A 4.0%	キリシロ 0.20%	293	3.2	104	97	92	89	93
	アロワ200V 1.0%								
	ダイオ 9.0%								
比較例									
1	化合物A 6.0%	キリシロ 0.35%	560	2.3	220	56	53	47	39
2	化合物A 6.0%	キリシロ 0.40%	670	2.5	250	43	45	34	56
3	化合物A 6.0%	キリシロ 0.15%	140	11.3	180	75	63	66	57
4	化合物A 6.0%	キリシロ 0.15%	135	13.2	200	67	59	53	49
5	化合物A 6.0%	キリシロ 0.40%	650	11.2	320	23	42	33	20

[0041] The example 2 of a trial: Fill up the plastics bottle of 1/2,000a. of the weeding-out effectiveness trials with paddy soil, and add and till water before transplantation. the rice rice seedling (form: a Japanese fine one, leaf age:2.5, height-of-grass:15cm) after inoculating a weeds seed, and-a nurseling seedling (form: -- a Japanese fine one --) Leaf age: 1.6 and height-of-grass:8cm were carried out in three [/share] each, it transplanted to the pot and, on the other hand, dropping processing of the letter constituent of aquosity suspension of said examples 1, 2, 5, 6, and 8 was carried out at transplantation and coincidence on 5l. per 1ha, and the soil front face of each experimental plot, respectively. Depth of water was set to 2-3cm 1 hour after processing, and this depth of water was maintained throughout [trial term]. Three weeks after processing, the phytotoxicity over the prevention effectiveness and the rice to weeds was investigated.

[0042] In addition, the weeding-out effectiveness makes 0% the case of being equivalent to a non-processed division, 100% for the case of full withering to death, and shows within the limits of it by % display.

[0043] Phytotoxicity evaluated the withering-to-death condition of a rice according to the above-mentioned weeding-out effectiveness.

[0044] A test result is shown in the 2nd table.

[0045]

[A table 3]

第 2 表

試験薬剤 実施例	除 草 効 果 %				イネ被害%	
	タイヌビエ	コナギ	広葉類	ウリカワ	乳苗	稚苗
1	100	100	100	—	0	0
2	100	100	100	—	0	0
5	100	100	100	100	5	5
6	100	100	100	100	0	0
8	100	100	100	90	0	0

[0046] Example 16: In the water rice field field of 10a. of water rice field field trials, dropping processing of the letter constituent of aqueous suspension of the specified quantity (5 l/ha) was carried out on the soil front face after tilling before transplantation using the spraying machine which it interlocks and is dropped at the plantation rate with which the six-article riding rice planting machine was equipped simultaneously with rice planting (paddy-rice form: a Japanese fine one, 2.7 leaf stages). After rice planting termination, it drowned in a river promptly and water depth was set to 2-3cm. It maintained at the depth of water of 2-3cm throughout [trial term], and the weed control effectiveness and the phytotoxicity over a rice were investigated after four weeks of rice plantings. In addition, the prevention effectiveness made 0% the case of being equivalent to the division non-processed [100%], and expressed the case of full withering to death with % display.

[0047] Phytotoxicity evaluated the withering-to-death condition of a rice according to the above-mentioned weeding-out effectiveness. Effectiveness has $\geq 90\%$, phytotoxicity has $\leq 10\%$, and it considers as practical tolerance.

[0048] A result is shown in the 3rd table.

[0049]

[A table 4]

第 3 表

試験薬剤 実施例	除 草 効 果 %					薬害%
	タイヌビエ	コナギ	広葉類	ミズガヤツリ	ウリカワ	イネ
1	100	100	100	40	20	0
6	100	100	100	90	100	0
8	100	100	100	100	100	0
13	100	100	100	90	100	0

[0050]

[Effect of the Invention] While having the effectiveness in which the letter herbicide constituent of aqueous suspension of this invention was dramatically excellent as an object for paddy rice transplantation simultaneous processing the passage clear from the above-mentioned example of a trial, activity labor and working hours can be substantially mitigated and shortened in the scene of a actual water rice crop, and it is very useful.

[Translation done.]

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.In the drawings, any words are not translated.

TECHNICAL FIELD

Field of the Invention] This invention relates to the agricultural-chemicals field, a new pharmaceutical preparation technique [in / especially / a herbicide], and the weed control approach. This invention relates to the letter herbicide constituent of aqueous suspension and the weed control approach for processing to paddy rice transplantation and coincidence in more detail.

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EFFECT OF THE INVENTION

Effect of the Invention] While having the effectiveness in which the letter herbicide constituent of aqueous suspension of this invention was dramatically excellent as an object for paddy rice transplantation simultaneous processing the passage clear from the above-mentioned example of a trial, activity labor and working hours can be substantially mitigated and shortened in the scene of a actual water rice crop, and it is very useful.

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TECHNICAL PROBLEM

A Prior art and a technical technical problem] In the agricultural-chemicals field, based on the pharmaceutical form of pharmaceutical preparation, the class is divided from old, especially, in the field of the herbicide for paddy rice, a use scene is the weed control in rice field area water, and the granule of a granular gestalt has occupied the mainstream in consideration of the ability to use [that a use dose can be supplied certainly and] it in reduction of labor. However, since it having to sprinkle to homogeneity as much as possible and relief of activity labor are measured in the whole rice field area water in the case of a granule gestalt, reduction of the irrelevance by increasing the content of the technique and active principle (weeding-out active ingredient) which enlarge the granule itself in recent years is measured.

0003] On the other hand, the herbicide constituent of an emulsion gestalt is also slightly used as an object for rice planting pretreatment conventionally as a liquids-and-solutions gestalt out of the solid preparation until now. Furthermore, recently, the herbicide of the letter of aqueous suspension is beginning to be used as an object for rice planting after treatment as a liquids-and-solutions gestalt. As a well-known technique about this letter herbicide of aqueous suspension For example, the aqueous suspension agricultural-chemicals pharmaceutical preparation whose ILB blended ten or less nonionic surfactant (one sort or two sorts or more) and the thickener for the purpose of stabilization of an agricultural-chemicals active ingredient (JP,60-1101,A), How (JP,62-84002,A) to use for rice planting pretreatment of a ponding paddy field the letter herbicide constituent for paddy fields of suspension with which a certain kind of specific compound was contained, and viscosity was adjusted to 250 to 30 centipoise, In the approach (JP,62-87501,A) of using the herbicide for water suspension paddy fields and it which have a specific physical property (viscosity, an initial ***** exhibition rate, and surface tension), before transplanting rice seedlings, and the aqueous suspension pharmaceutical preparation which atomized The letter agricultural-chemicals pharmaceutical preparation of aqueous suspension aiming at suppressing especially the particle growth by the high temperature service (JP,5-43401,A), The letter herbicide constituent for paddy fields of suspension which paid its attention to antisticking of the drugs to the rice leaf blade which is the description of the mixture, and which scatters and mainly originates in spraying (JP,5-105601,A), The application-on-water-surface weeding-out pharmaceutical preparation (JP,5-201801,A) aiming at improvement in long-term-storage stability and underwater diffusibility etc. is mentioned.

0004] Thus, although the technique about many letter pharmaceutical preparation of aqueous suspension is proposed, technical problems which should be solved, such as maldistribution-izing of the weeding-out effectiveness that the problem of adhesion in the leaf blade section of the paddy rice rice seedling resulting from the liquids-and-solutions solid pharmaceutical preparation which they have essentially, and a dusting powder agent scatter, and diffusibility happens to the problem of unevenness and a list at eye the backlash which is not enough, and a problem of generating of phytotoxicity, still remain.

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MEANS

Means for Solving the Problem] In order to solve the above-mentioned technical problem, as a result of performing examination from the field of the approach of the letter pharmaceutical preparation of aqueous suspension itself, with the letter herbicide constituent of aqueous suspension for paddy rice transplantation simultaneous processing explained below, this invention persons find out that the above-mentioned technical problem is solvable, and came to complete this invention this time.

0006] Namely, according to this invention, it comes to contain one sort or two sorts or more of 0.5 - 60 % of the weight of weeding-out activity compounds and 30 - 97 % of the weight of water, poor solubility or insolubility, in the water whose middle particle diameter is 0.5-10 micrometers. And the letter herbicide constituent of aqueous suspension for paddy rice transplantation simultaneous processing characterized by containing the surfactant of a complement further maintaining this weeding-out activity compound at a suspension condition, and the viscosity in 25 degrees C being within the limits of 90 - 500 mPa-s is offered.

0007] according to this invention, since the letter herbicide constituent of aqueous suspension for the above-mentioned paddy rice transplantation simultaneous processing is used for paddy rice transplantation, simultaneously rice field area water, it not only being able to make timely discovered but it can perform uniform drugs processing and the operation effectiveness of a weeding-out active ingredient is exactly referred to as being able to process to package coincidence at the time of rice planting from the point of working efficiency (laborsaving) -- it is dramatically advantageous practically and excels. Since machine transplantation of the present paddy rice seedling is performed widely, especially the above-mentioned constituent of this invention has the advantage that it can process to paddy rice transplantation and coincidence easily, by equipping a machine for planting seedlings with the container of this constituent beforehand, and usually using a desired dose for rice field area water with transplantation of a machine for planting seedlings.

0008] In this invention, "middle particle diameter" is used as a scale which shows the "average particle" system of a particle group, and the value is shown with the value of particle diameter in case the cumulative distribution which integrated with and searched for the frequency distribution showing what% of the whole particle exists within the fixed grain-size section from the one where particle diameter is smaller, or the larger one show 50%. The weeding-out activity compound used in this constituent of this invention can have preferably 0.5-10 micrometers of middle particle diameter within the limits of 1-5 micrometers.

0009] Although the weeding-out activity compound used by this invention is not especially restricted if it is usually used as an object for paddy fields, a poorly soluble or insoluble thing is suitable for it in water especially. Here, "they are poor solubility or insolubility to water" means that the solubility to the water in 25 degrees C is 100 ppm or less in general. A deer can be carried out and the following can be illustrated in such water as an example of representation of poorly soluble or insoluble weeding-out activity compound.

0010] A 2-benzothiazole-2-yloxy-N-methyl acetanilide, (RS) -2-BUROMO-N-(alpha and alpha-dimethylbenzyl)-3 and 3-dimethyl butyl amide, 2-chloro - 2' and 6'-diethyl-N-(2-PUROPO pheasant ethyl) acetanilide, 2-chloro - 2' and 6'-liethyl-N-(BUTOKI dimethyl) acetanilide, A 2-chloro-N-(3-methoxy-2-thenyl)-2' and 6'-dimethyl acetanilide,